

**AMENDMENTS TO THE SPECIFICATION**

***In the Title of the Invention:***

Please **CHANGE** the title to read:

-- LIGHT EMITTING DEVICE HAVING A SENSOR FOR DETERMINING  
LUMINOUS INTENSITY --

***In the Specification:***

Please **AMEND** the specification as shown in the following marked up paragraph, which shows changes made relative to the immediate prior version.

*At page 17, at the paragraph starting at line 23:*

The light emitting element 4 emits the light 5 in an upper direction in the drawing, and a portion of the light 5 thus emitted is inputted to the light sensor 1.

*At page 19, at the paragraph starting at line 15:*

A gate 194a of a switching transistor 183 is connected to a first switching line 187, and a source 193a of the switching transistor 183 is connected to a second switching line 188. A drain 195a of the switching transistor 183 is connected to one end of a voltage holding capacitor 185 having the other end connected to ground 190, and to a gate 194b of a current applying transistor 184. The voltage holding capacitor 185 can be omitted in some case. A source 193b of the current applying transistor 184 is connected to a current source 191, and a drain of the current applying transistor 184 is connected to an anode of a light emitting element 182. A cathode of the light

emitting element 182 is connected to the ground 190. An anode of a light sensor 209 is connected to the ground and a cathode of the light sensor 209 is connected to a drain 195d of a second switching transistor 208b for a light sensor switching. A gate 194d of the second switching transistor 208b for the light sensor switching is connected to a drain 195c of a first switching transistor 208a for a light sensor switching. A voltage holding capacitor can be connected between the drain 195c and the ground 190 in some case.

*At page 25, at the paragraph starting at line 20:*

On the upper electrode 11, a third interlayer insulator film 30 is formed as shown. On the third interlayer insulator film 30, a patterned lower electrode 31 formed of a transparent electrode film, of the sensor part, is formed. The patterned lower electrode 31 of the sensor part is connected to an interconnection (not shown). On the second transparent electrode pattern 31, a p-type semiconductor 32 ~~33~~ and an n-type semiconductor 33 are formed to form a pn junction therebetween. Furthermore, an upper electrode 34 of the sensor part is formed on the Semiconductors thus formed, and is connected to an interconnection (not shown). Here, the sensor part will be never limited to this shown shape, - as will be explained hereinafter.

*At page 26, at the paragraph starting at line 4:*

Fig. 12 is a typical diagrammatic plan view illustrating the light emitting element having the sectional structure shown in Fig. 11 and its peripheral portion including the interconnection. The first switching line (gate line) 187 is connected to the gate 194 of the switching transistor 183. The second switching line (data line) 188 is connected to the source 193a of the switching

transistor 183. The drain of the switching transistor 183 is connected to the gate 194b of the current applying transistor 184 and one terminal (an underlying electrode of a portion designated by 185 in the drawing) of the voltage holding capacitor 185 that is formed between the ground line 186 and the underlying electrode. The other terminal (an overlying electrode of a portion designated by 185 in the drawing) of the voltage holding capacitor 185 is connected to the ground line 186. The source 193b of the current applying transistor is connected to the lower electrode 13. To cover the whole surface of the drawing, the light emitting material layer and the upper electrode layer (both not shown) are formed in the named order, and the upper electrode is connected to the current supplying source (not shown). A light emitting region is defined by the pattern of the lower electrode 13. The drain 195b of the current applying transistor 184 is connected to the ground line 186. Above a portion of the light emitting element, the light sensor 201 is formed, which includes the pn junction portion 203 sandwiched between the sensor upper electrode 204 and the second transparent electrode 200 of the sensor lower electrode. Although not shown, the n-type semiconductor of the pn junction portion is contacted with the sensor lower electrode, and the p-type semiconductor of the pn junction portion is contacted with the sensor upper electrode. The second transparent electrode 200 is connected to the ground line 186, and the sensor upper electrode 204 is connected to the drain 195d of the second transistor 208b for the light sensor switching. The source 193d of the second transistor 208b for the light sensor switching is connected to the light sensor current detecting line 207, and the gate 194d of the second transistor 208b is connected to the drain 195c of the first transistor 208a for the light sensor switching. The gate 194c of the first transistor 208a is connected to the first line 206a for the light sensor switching. The source 193c is connected to the second line 206b for the light sensor switching.

**AMENDMENTS TO THE DRAWINGS**

Attached hereto are replacement figure sheets for Figures 13G, 13H, 13I, 13J and 13K, which include the changes, without markings, identified below.

Figure 13I has been amended to delete reference character 29b and replace it with reference character 29. There have been no changes to Figures 13G, 13H, 13J or 13K.

**REMARKS**

By this amendment, claims 1, 3, 5 and 6 have been amended, claim 2 has been cancelled without prejudice or disclaimer. Accordingly, claims 1 and 3-8 are currently pending in the application, of which claim 1 is an independent claim.

Applicants respectfully submit that the above amendments do not add new matter to the application and are fully supported by the specification. No new matters are believed to be added by these Amendments. In view of the above amendments and the following Remarks, Applicants respectfully request reconsideration and timely withdrawal of the pending objections and rejections for the reasons discussed below.

***Drawing Objection***

In the Office Action, the drawings were objected to as failing to comply with 37 CFR 1.84(p)(5) for including reference sign(s) not mentioned in the specification.

Applicants note that while Figure 12I was identified as containing reference character 29b, there is no Figure 12I and Figure 12 does not contain a reference character 29b. Therefore, Applicants assume that Figure 13I is intended in this objection. Figure 13I has been amended to delete reference character 29b and replace it with reference character 29, as shown in the attached drawing sheets. Accordingly, Applicants respectfully request withdrawal of this drawing objection.

In addition, the specification has been amended to include the reference characters in Figures 1, 3, 11, and 12, as identified in the drawings objections. Specifically, the specification was added to include reference character 5 (Figure 1), reference character 195a (Figure 3),

reference character 32 (Figure 11), reference character 5 (Figure 1) and reference character 201 (Figure 12). Accordingly, Applicants respectfully request withdrawal of these drawing objections.

***Title Objection***

In the Office Action, the title of the invention was objected to as not being descriptive. The title has been amended to read:

-- LIGHT EMITTING DEVICE HAVING A SENSOR FOR DETERMINING  
LUMINOUS INTENSITY --.

Accordingly, Applicants respectfully request withdrawal of the objection to the title.

***Rejections Under 35 U.S.C. §112, second paragraph***

Claims 5-8 stand rejected under 35 U.S.C. §112, second paragraph as being indefinite. Applicants respectfully traverse this rejection for at least the following reasons.

Claims 5 and 6 are been amended to clarify that, in claim 5, a hole injection and transport layer is provided between the light emitting layer and the anode, and, in claim 6, an electron injection and transport layer is provided between the light emitting layer and the cathode. This amendment is made for the sole purpose of clarifying claims 5 and 6. This amendment is not made for the purpose of avoiding prior art or narrowing the claimed invention, and no change in claim scope is intended. Therefore, Applicants do not intend to relinquish any subject matter by these amendments. Applicants respectfully submit that claims 5 and 6, as amended, and claims 7

and 8, which depend therefrom, fully complies with the requirements of 35 U.S.C. §112, second paragraph.

Accordingly, Applicants respectfully request withdrawal of the 35 U.S.C. §112, second paragraph rejection of claims 5-8.

***Rejections Under 35 U.S.C. §103***

Claims 1 and 3 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Japanese Publication No. 590055487 (“Nippon”) in view of Japanese Patent No. 361134084A (“Mori”). Claim 2 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Nippon in view of Mori and U.S. Patent Publication No. 2003/0025136 to Zhang *et al.* (“Zhang”).

Applicants respectfully traverse this rejection for at least the following reasons.

Claim 1 has been amended to incorporate the features of claim 2, and more specifically, to include that the “the light sensor is formed on said upper electrode of said light emitting element.” Applicants respectfully submit that the prior art of record does not teach or suggest this feature.

As recognized by the Office Action, Nippon does not disclose a light sensor formed on a light emitting element, let alone a light sensor on the upper electrode of the light emitting element.

Further, Mori fails to teach or suggest placing the light sensor on an upper electrode. As shown in Fig. 3 of Mori, light receiving element 50 is located on insulation layer 4. That is, an insulation layer 4 is located between light emitting element 20 and light receiving element 50. Therefore, Mori fails to teach this element of claim 1.

Finally, the Office Action asserts that Zhang discloses a light sensor on an upper electrode. Applicant respectfully submit that Zhang, rather than teaching a light sensor on an upper electrode, teaches two TFT's placed side by side, with one TFT for display and the other TFT for light reception. *See* Zhang, ¶ 37. The "sensor portion reads a light signal incident on the back surface of the liquid crystal display surface so that a picture is taken in." *Id.* Thus, the sensor is not located on the upper electrode of the light emitting element.

Further, Zhang is directed toward a completely different issue. Specifically, the sensor detects light on the back surface, stores the data, "and then, the data are inputted from a display portion lead terminal portion 405, so that a picture is displayed onto the display portion 402." *See* ¶ 39. Rather, "the sensor portion senses a light signal havng passed through an optical system 409 attached to the back surface, a color filter 411 and further substrate 400." *See* ¶ 41. Thus, as seen with reference to Figs. 4A and 4B, the sensor is located in sensor portion 402 (*see* Fig. 4A), while the light comes from the back surface through optical system 409 (*see* Fig. 4B). Therefore, Zhang clearly does not teach placing a sensor on the upper electrode of a light emitting element.

For at least these reasons, none of Nippon, Muri and/or Zhang teach or suggest, either alone or in combination, having a sensor located on the upper electrode of a light emitting element. Therefore, Applicants respectfully submit that the claims are patentable over the prior art of record, and request that the rejection be withdrawn and the claims passed to issue.



***Dependent Claims***

Claim 4 stands rejected as unpatentable over Nippon in view of Mori and U.S. Patent No. 5,105,238 to Nikaido *et al.* (“Nikaido”). Claim 5-7 stand rejected as unpatentable over Nippon in view of Mori, Nikaido and U.S. Patent No. 6,133,581 to Terao *et al.* (“Terao”). Claim 8 stands rejected as unpatentable over Nippon in view of Mori, Nikaido, Terao and U.S. Patent No. 4,820,915 to Hamakawa *et al.* (“Hamakawa”).

Claims 4-8 depend from independent claim 1. None of Nikaido, Terao, and Hamakawa, either alone or in combination, remedy the deficiencies of Nippon, Mori and Zhang as discussed above with respect to claim 1. Therefore, for at least the reasons set forth above with respect to claim 1, claims 4-8 are patentable over the prior art of record. Applicants respectfully request that the rejection be withdrawn and the claims passed to issue.

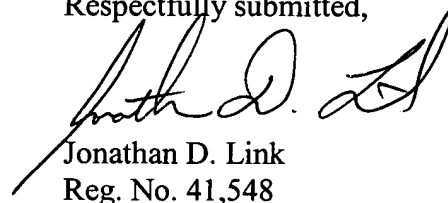
**CONCLUSION**

Applicants believe that a full and complete response has been made to the pending Office Action and respectfully submits that all of the stated objections and grounds for rejection have been overcome or rendered moot. Accordingly, Applicants respectfully submit that all pending claims are allowable and that the application is in condition for allowance.

Should the Examiner feel that there are any issues outstanding after consideration of this response, the Examiner is invited to contact the Applicants' undersigned representative at the number below to expedite prosecution.

Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully submitted,



Jonathan D. Link  
Reg. No. 41,548

Hae-Chan Park  
Reg. No. 50,114

Date: July 13, 2004

**McGuireWoods LLP**  
1750 Tysons Boulevard  
Suite 1800  
McLean, VA 22102-4215  
Tel: 703-712-5365  
Fax: 703-712-5280  
HCP:JDL/bjb